IDF Animal Health Newsletter

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Preface

One year ago the first issue of the IDF Animal Health Newsletter was created and distributed atthe IDF World Dairy Summit held in Dublin, and shortly afterwards. Now the World's dairy leaders are gathered in Mexico and a new issue of the Animal Health Newsletter has been prepared. As members of the IDF Standing Committee on Animal Health and editors of the Animal Health Newsletter, we are happy to provide you with this issue. The primary goal of the Animal Health Newsletter is to provide the IDF community with knowledge on the activities of IDF in the field of animal health. It also provides a platform for exchanging news, meetings and short descriptions of newly available research results. The latter are mostly provided through members of the IDF Standing Committee on Animal Health.. However, other contributions are also welcomed. We hope this issue of the Animal Health Newsletter will give you insight into activities in and around the IDF Standing Committee on Animal Health

If you want to contribute to the Newsletter by providing us with the results of research of interest to the dairy community as well as information on recent or forthcoming meetings do not hesitate to contact us.

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From the Chairman of IDF Standing Committee on Animal Health

Dear Reader!

The Standing Committee of Animal Health (SCAH) has undergone a big change in the past four years. The former IDF A2 Group of experts, which only handled mastitis, has developed into a committee that deals with all aspects of dairy animal health and helps several other IDF committees, task forces and action teams in their work. This Newsletter,too, has undergone a change in consequence.

Thus, in recent years we have worked with mastitis, claw diseases and foot and mouth disease by way of example. The IDF Mastitis Conference was held in Maastricht in 2005. All this work has led to various publications, several of which can be studied on the IDF internet and intranet sites. The committee has also helped in organizing the programme of several IDF World Dairy Summits and other international gatherings. Committee members have participated on behalf of the IDF in many international seminars, committee and working group meetings, for example the OIE Animal welfare working group meetings and FAO hearings on the same topic. Committee members have also given their views on various papers, for example on the Codex work on antimicrobial resistance.

I hope the SCAH will become even more dynamic in the future. I especially wish that we could activate our members around the world to play a greater part in the committee work!

More work needs to be done about prevention of diseases. In particular, large dairy units will need much more information about handling infection pressure and other factors tending to increase the risk of disease. Animal welfare also has a central role in the future, both economically and ethically.

It has been very interesting to work for the IDF SCAH these past 4 years! I wish the committee very much success in the future!
Thank you!

Helsinki, October 10th,2008
Laura Kulkas
Chair of IDF SCAH

Ongoing work in the Standing Committee

Antimicrobial resistance

The emergence of antimicrobial resistance in bacteria has had profound effects on the management of therapeutic approaches to both human and veterinary diseases. The SCAH Action Team on antimicrobial resistance has the specific goal to determine if scientific data exist to demonstrate an emergence of antimicrobial resistance in mastitis pathogens after four decades of antimicrobial drug use in dairy cows. Current data do not implicate an apparent emergence or progression of resistance among bacteria causing bovine mastitis. However, isolated reports of resistant strains and detection of resistance genes

in bacteria found associated with dairy cattle and dairy products underline the need for prudent and vigilant oversight of management conditions. The SCAH Action Team will continue to monitor and report new research results, together with with historical data, in order to alert the dairy industry of any confirmed changes in antimicrobial resistance among mastitis pathogens. Appropriate and coordinated responses to prevent and control spread of resistance by management of therapeutic regimes will be proposed if an emergence of antimicrobial resistant among mastitis pathogens is confirmed.

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Mastitis terminology

New work on the revision of Bulletin of IDF N° 338/1999 was approved in 2007 and a Project Group was established to accomplish the text, comprising the following experts: C Burvenich (BE), J Hogan (US), D Scholl (CA), J Hamann (DE), S Dabirian (IR), AC Whist (NO), L Sølverød (NO), V Turner (ZA), A Zecconi (IT), Yi Seok JOO (KR) and E Hopkin, Hon member of IDF (leader of the PG).
Contributions to the work so far have also been made by E Berry (GB), J E Hillerton (NZ) and H Hogeveen (NL).

The work was launched in April 2008. The members of the Project Group were invited to comment on the existing mastitis terminology texts in Bulletin of IDF N° 338/1999 and N° 394/2005, together with a collection of new terms gathered from recent papers in the scientific literature.
These comments have been circulated in a further round of comments and the Project Group members invited to consider suggestions for amendment of the Bulletin N° 338 text. At the time of writing a complete text of the revision of Bull N° 338/1999 is being prepared for consideration by the Project Group, bearing in mind the comments that have been made so far. If the PG members approve, this text will be forwarded to the Action Team on Mastitis for submission to the SC on Animal health to approve it for publication by IDF.

It is hoped that the revised text can be submitted to the SC on Animal health before 31 December 2008.

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Production Diseases

The Production Diseases Action Team was reactivated during the last SCAH meeting in Brussels in March 2008. The leader is J. Hamann (DE) and the following are present members of the Action Team:
Cheryl McCrindle (ZA), Kerstin Plym-Forshell (NO) Henk Hogeveen (NL).
The opinion of IDF experts is especially relevant as the dairy sector confronts the current crisis in food prices.

Firstly, It is intended to re-define the term "Production Diseases". Secondly it is planned to work on important diseases other than mastitis, e. g. lameness, infertility, metabolic disorders and infectious diseases. The proposal for the work consists of writing a report dealing with each disease complex with the following sections:

1.) Name of the disease;
2.) Basic information;
3.) Symptoms;
4.) Prevention;
5.) Therapy;
6.) Economic consequences.

Anybody who is interested to be an active member should contact J. Hamann. Moreover, everybody who has material which could be used for writing the planned report is asked to send it to J. Hamann.

It would be of really great importance for this topic to get the support of a lot of colleagues in the SCAH. Thank you.

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Animal welfare in dairy production

The International Dairy Federation Guide to Good Animal Welfare in Dairy Production

In September 2008 the IDF Guide to Good Animal Welfare was published. Its purpose is to define and promote good stockmanship and animal husbandry that come together to ensure good welfare for animals in dairy production systems.
This IDF work item progressed from the IDF/FAO Guide to Good Dairy Farming Practice released in 2004 and provides further definition by the IDF as to what is required for good standards of animal welfare for dairy production animals. The process of writing of the document included extensive consultation between and within the member countries, thus many people from many countries have contributed to this work and must be recognised and thanked for their contributions.

The over-riding objective was to create information that would be practical, useful and applicable in the "real world". The immediate need was find a way to deal with the broad diversity of dairy production systems around the world which are both extensive and intensive, which may produce for international markets or community milk schemes and which incorporate a range of small and large ruminant species. The common elements are milk for human consumption and the nature of the animals that produce it. When we recognise this unity within diversity we no longer need to consider the specifics of individual production systems. The needs of the milking animal, regardless of its species, become the common denominator of all dairying systems and the success of any system in meeting these needs can be measured. This ensures that assessment methodology focus on measures that are based on the outcomes for the animals themselves. By using outcome-based measures we also facilitate the demonstration of equivalence across our diverse systems and discharge any need for direct comparison.

To achieve good practice in animal welfare means having good husbandry practices, having physical strategies to relieve constraints of the production system, having well-planned herd health programmes and ensuring that the animals selected for the production system are suitable. The document provides information based on science, to ensure defensibility, and it recognises the key role of the farmer and stockperson in ensuring that good welfare is achieved at farm level.

Based on the principles and delivery of the traditional Five Freedoms for achieving animal welfare, the guidelines describe Key Action Areas to be considered when implementing quality management systems for dairy animal welfare. Each Action Area has an associated set of principles that can be used to further define best practices for individual quality management systems.

The Action Areas are:

- Stockmanship
- Feed and water
- Physical environment
- Husbandry practices
- Health management

The IDF Guide to Good Animal Welfare in Dairy Production is available for download free-of-charge from the IDF Internet homepage : www.fil-idf.org .

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BSE: "Milk is Safe"

No infectious prions in bovine milk

The potential occurrence of infectious prions (PrPsc (from scrapie)) in the milk of BSE infected cows has been discussed for nearly 15 years. More recent findings on the presence of normal prions (PrPc = cellular prions) in the milk of several species including cattle have stimulated anew the discussion about whether, under certain conditions, infectious prions might also occur in bovine milk. This discussion is also linked to the scientific observations that in the mammary gland and in the milk of small ruminants (sheep of a highly susceptible breed) PrPsc has been detected and proved to be infectious. Even if the pathogenesis of scrapie is different from that of BSE, insofar as the scrapie agent is widely distributed in the body where this is not the case in BSE infected cattle, discussions started again in 2006/2007 on the potential presence of infectious prions in bovine milk.

The discussion has been stimulated additionally by recent findings that BSE infected cattle in the final stage of the disease have shown infectivity in tissues such as the tongue muscle and respiratory tissues which have formerly been regarded as "free from" infectious prions.

The **scientific background** with respect to the findings of normal prion proteins (PrPc) in bovine milk and the **potential occurrence of the infectious type** is important for the understanding and correct interpretation of the facts:

- **PrPc is a naturally occurring protein in vertebrates** and is present in many tissues such as brain, muscle, heart, urine, blood and milk and **is not infectious**. It plays a physiological role which is currently not completely understood;
- The **conversion of PrPc into infectious PrPsc** would only be possible in the presence of PrPsc k ("mouse trap effect");
- However: Infectious prions (PrPsc) have not been detected in milk until now;
- **Therefore: Conversion of PrPc into PrPsc in bovine milk is a hypothetical speculation without scientific background**.

The **absence of infectious prions in bovine milk** has been demonstrated in a number of scientific publications and statements of national and international organizations including WHO, FAO and the European Food Safety Authority (EFSA). The most important results are given below:

- 1993/2005: Milk or colostrum from clinically BSE infected cows was injected intracerebrally and intraperitoneally into or fed orally to mice. None developed any form of spongiform encephalopathy (Middelton and Barlow, 1993; Buschmann and Groschup, 2005);
- 1997-1998: A serious indication that milk does not transmit BSE was the **beef suckler study** in the UK where no cases were reported although all of the calves received colostrum and milk from BSE infected cows (Wilesmith et al, 1997, Donnelly, 1998);
- 2005-2006: **The study funded by the UK Food Standards Agency (FSA)** and aimed at detecting PrPsc in milk of

cattle infected with the BSE agent has concluded the absence of PrPsc in the cell fraction of milk collected at different stages of lactation from the incubation period to clinical onset of BSE, even in cases of mastitis. **No infective prions** have been detected (Everest et al., 2006).

For the **interpretation of these studies** it has to be mentioned that methods have been used for the detection of PrPsc which do not meet the detection limits of recently developed new analytical technologies as the Protein Misfolding Cyclic Amplification (**PMCA**) which allows a 10^6-10^7 fold amplification of minimal "not detectable" amounts of PrPsc.

In summary it can be concluded that the statement "milk is safe - no infectious prions detectable" is scientifically still valid without any restrictions. However, the development of extremely sensitive detection methods for infectious prions will make it highly probable that investigations on the detection of infectious prions in milk will continue. Therefore, the **development of an effective risk communication strategy** for the correct information of the public is needed clarifying

- the difference between normal and infectious prions;
- that no infectious prions (PrPsc) have been detected in cow's milk and
- that the situation (presence of PrPsc in the mammary gland and the milk) in small ruminants is not comparable with the situation of BSE in cattle due to the different distribution of prions ("pathogenesis") in the body of small ruminants and cattle.

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Websites (for further information)

- European Food Safety Authority (BIOHAZ Panel): www.efsa.europa.eu
- Spongiform Encephalopathy Advisory Committee (SEAC): www.seac.gov.uk
- Network Neuroprion: www.neuroprion.com
- TAFS Forum (Transmissible Animal Diseases & Food Safety): www.tafsforum.org

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Foot and Mouth Disease

Issues for the Dairy Industry to consider in the management of an outbreak of Foot-and-Mouth Disease

A report written by David C.M. Mouat, United Kingdom, in cooperation with a group of IDF experts from nine countries describes the more significant impacts that will be felt by the dairy industry in any country affected by the disease.

Effects of an outbreak

It is very important to understand and to acknowledge that the dairy industry will still be affected when the outbreak is restricted to non-dairy livestock e.g. pigs or beef-producing animals. In such an outbreak the dairy industry will still need to take biosecurity measures to protect itself against becoming affected. It is also well known that dairy livestock which are in the early stages of the disease and not yet showing clinical signs can excrete the virus in their milk.

The effects of an outbreak of FMD therefore would be significant for any country involved in the outbreak and possibly even for neighbouring countries when outbreaks are near to international borders. The impact of such an outbreak would be felt across a wide range of businesses and would have a significant and immedate impact on the national economy of countries that rely on export markets for milk and milk products. All parts of the dairy industry would be affected – from production on farms through the distribution and processing of milk to the manufacture of milk products.

It therefore, is essential that all parts of the dairy industry are aware of what will happen if there is an outbreak and fully understand what the impact of the control measures that are proposed by the veterinary authorities will be on their businesses.

Actions taken at a disease outbreak

At a disease outbreak many countries will adopt a stamping out policy together with animal health based sanctions such as a ban on the movement of livestock, restrictions on the movement of infectious material, people, and vehicles and equipment to and from the affected premises. Restrictions may also be applied to milk quality testing in that milk samples may not be moved from farm to laboratory.

The use of vaccination as an alternative/complement to stamping out is discussed, together with its pros and cons:

- vaccination may reduce the amount of field virus circulating within the population but vaccination may not stop an animal becoming infected. The severity of the clinical disease would be reduced but the animal could still excrete virus and infect other animals around which are not immune.
- there are so many different strains of the virus and vaccination against any one of them does not guarantee protection against other strains.
- the duration of the immunity is short lived and boosters are required to keep the animal protected.

Border or import controls are only effective when the international border is actively monitored and secure. Wild animals must not be able to cross the border and the smuggling of animals and their products must also be controlled.

Contingency plans and economic impact

Each part of the dairy sector needs to develop its own contingency plans in order to be able to continue functioning during an outbreak.

The economic impact is considerable at farm level, but also for the dairy processing industry with increased costs for collection of milk, using filters in the tankers, increased heat treating of milk and waste waters, and so on.

Specific biosecurity measures (cleansing and disinfection) are required when vehicles enter and leave the farm to try to ensure that the vehicles are not implicated in the spread of disease. Similar measures are applied to other vehicles that go from farm to farm, e.g. feed delivery lorries. The effect of these measures is to increase the time taken for, and possibly the distance between, each farm collection. This can make feed delivery or milk collection longer and less efficient.

In many countries economic studies or cost benefit analyses have been carried out on the impact of an outbreak of FMD. These are used to support decisions taken to control the outbreak of the disease such as the choice between vaccination and culling.

Processing of milk

In order to ensure that any virus that may be present in milk is inactivated some countries require a double treatment of milk at a higher temperature if it is to be fed to livestock such as calves, lambs, kids, or pigs.

This double treatment specification is very difficult for many dairies which operate an on-line continuous flow High Temperature Short Time pasteurisation process (71.7°C for 15 seconds) as milk which has been treated once must be cycled back through the heat exchanger. In many dairies the pipework for the liquid milk does not lend itself to such recycling. This is, however, not a problem for bulk processing in dairies.

Distribution of milk

It is not necessary to apply controls on the movement of milk which has been effectively heat treated such that any FMD virus present has been inactivated. Likewise, heat-treated or pasteurised milk need not be controlled by the veterinary authorities if it is only intended for the human population, e.g. sale of fresh milk directly or indirectly to the final consumer or to premises where it is made into a milk product such as cream, cheese, butter, or milk powder .

Not all milk products however, are made from pasteurised milk. In many countries the production of raw milk cheeses including soft cheeses from sheep or goats requires the use of unpasteurised milk. In some countries cream and butter are also manufactured from unpasteurised milk. Such industries would require unpasteurised milk from other sources in the event of an outbreak and this could increase costs or even stop production if an alternative source cannot be found.

Final remark

An outbreak of FMD in any country is a major event with wide ranging consequences for the Government, the livestock industry and for many other industries.

It therefore is essential to revise and implement existing contingency plans to be sufficiently prepared in case of an outbreak of the disease.

The whole report will, according to the plans, be published in the Bulletin of IDF.

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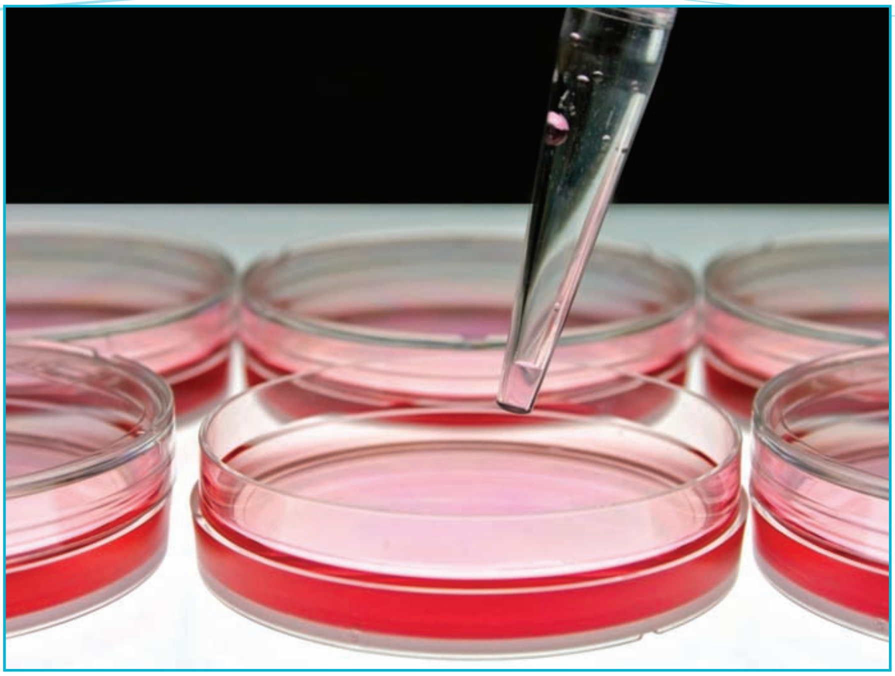
New research findings

Behavioral change to control somatic cell count



Adoption and implementation of management practices to control somatic cell count (SCC) is an action of behavioral change. However, behavioral change is in general notoriously difficult to achieve and sustain (Panter-Brick et al., 2006). Conceptually, the road map for accomplishing behavioral change differentiates between awareness, intention and action. First, farmers have to be aware of the current suboptimal condition. Awareness does not necessarily imply understanding, just the ability to be conscious of it. Second, they have to obtain an intent to alter management practices. This is not only influenced by their knowledge, but also by their attitude towards it. Third, efficient or satisfying control strategies need to be feasible before action can be expected, i.e., belief in the efficacy of the measures intended. Farmers who are well aware of the necessity to manage SCC but who do not believe they are able to control the situation are less likely to take (preventive) measures than farmers with strong feelings of control. Studies reporting relationships between herd characteristics and management practices associated with bulk tank SCC (BTSSC) are numerous (e.g., Khaitsa et al., 2000). More intangible elements such as awareness and intent, however, are often not mentioned. Omitting the context in which farmers make choices is one of the reasons why failures in preventive programs as well as in treatment programs are not immediately understood by the health professionals advising them (Vaarst et al., 2002).

The 'value of information' notion stipulates that information adds to knowledge and thus to the awareness of the person receiving it, enabling him to make improved decisions. Within this notion, additional information will make the decision maker more aware of an event. Although farmers may know that elevated SCC levels cause production inefficiencies, quantification of the effect may perhaps motivate them to act. Subsequently they need to compare the cost of measures intended to reduce SCC with the anticipated benefits from a reduction (Losinger, 2005). By means of in-depth interviews of dairy farmers working with a developed information tool awareness, intentions and stated actions are elicited. The hypothesis was tested as to whether economic information makes farmers more aware and whether it is an incentive to motivate farmers to alter their intent with respect to applied SCC control strategies.

The majority of the nineteen dairy farmers interviewed did not perceive the cow-specific projected losses as valuable in the sense of their being able to exploit them; their average rating was 1.84 on a five point scale ranging from "not valuable" up to "valuable" (Table 1). In general, respondents did not question the validity of the estimated projections. Although projected losses were split between yield loss and monetary loss, farmers found it difficult to discriminate between these two alternative units of measurement and thus rated them always identical. However, when farmers were asked to approximate losses induced by elevated SCC levels themselves they could express them more easily in terms of physical units than formulating them in terms of monetary losses which created more ambiguity and discomfort.

Only supplementary information adds to the knowledge and thus the *awareness* of the person receiving it. Projected losses were mostly in line with their approximations (2.74), although farmers were often lacking confidence and were reluctant to disclose their guesstimates. There was however a tendency towards relief since projected losses did not exceed their approximations. A complementary variable showed that farmers were well aware of their achievements compared to those of colleagues. The farmers of low BTSCC herds rated themselves as such, as did those of the high BTSCC herds. For example, the low BTSCC group – with an actual average deviation of -65 000 cells/ml – consistently rated themselves as having better results than other farms (average score of 3.89 and standard deviation of 0.60) compared to the high BTSCC group (average score of 2.20 and standard deviation of 0.79).

A farmer who knows the impact that elevated SCC levels have on production might have a more ambitious *intention* to reduce it. Aspiration levels were expressed as levels of feasibility according to the farmers and differed between them. Average aspiration levels amounted 149 000 cells/ml with a difference between actual and aspiration level of 49 000 cells/ml, while for the high BTSCC group this was 178 000 cells/ml (68 000 cells/ml difference). None of the farmers made efforts to achieve lower levels than 100 000 cells/ml.

Belief in efficacy of the current approach towards SCC management was discussed in relation to the perceived risk of penalties and efforts made to control SCC. Farmers

Table 1: Evaluation of the information tool on economic losses due to elevated SCC.

	Low BTSCC (<175 000/ml)		High BTSCC (≥175 000/ml)
	n=19	n=9	n=10
Perceived values			
Perceived value of information at farm level[1]	2.32	2.44	2.20
Perceived value of information at cow level[1]	1.54	2.11	1.60
Awareness			
Deviation from perceived production loss[2]	2.74	2.67	2.80
Perceived deviation from other farmers 3 *	3.00	3.89	2.20
Actual absolute deviation SCC from herdbook average (1000/ml) *	-1	-65	36
Intention			
Aspiration level SCC, Absolute (1000/ml) *	149	116	178
Difference actual SCC - aspiration (1000/ml) *	49	28	68
Efficacy belief			
Perceived probability of penalties [4]	2.55	2.22	2.85
Perceived efforts made to control SCC [5]	3.26	3.44	3.10

[1] 1=not valuable; 3=somewhat valuable; 5=valuable.
[2] 1=much lower than expected; 3=in line with expectation; 5=much higher than expected.
[3] 1=much higher than other farmers; 3=in line with others; 5=much lower than other farmers.
[4] 1=never occurs; 2=very unlikely; 3=unlikely; 4=possible.
[5] 1=much less than other farmers; 3=in line with others; 5=much more than other farmers.
* Statistical significant difference between sub-samples P<0.10

with higher cell counts were also well aware of the probability of adverse outcomes with respect to milk payments. They rated the probability of penalties as unlikely (2.85) while the respondents with lower SCC perceived it as very unlikely (2.22). Culling of notoriously high SCC cows was regarded by farmers with high BTSCC levels as a last option, but at the same time as a very effective way to avoid penalties. However, both groups perceived that they were more motivated to control subclinical mastitis by comparing their efforts with those of colleagues. Some farmers overstated their efforts indicating that they either gave socially desired answers or that information about the efforts made by others was lacking.

In general, the perceived trade-off between the costs of measures intended to reduce cell count with the anticipated benefits differed substantially. Control practices that were found successful by some farmers were found to be too expensive or impractical to implement by other farmers. A pervasive problem encountered was the difficulty of disentangling intentions from beliefs in efficacy, at an empirical level,.

In conclusion, the in-depth interviews revealed that the majority of the dairy farmers perceived cow-specific and herd-specific projected losses due to elevated SCC levels as not very relevant to them. Farmers contended that SCC was already monitored regularly at cow-level and provided them adequate information to support decision making. Actions were rationalized in a specific context comprising the intertwined notions of intentions and belief in efficacy. Understanding of these notions is essential when advising farmers, whether one is a veterinarian or another kind of agricultural extension advisor, to support farmers implementing enhanced management decisions.

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This research is a summary of the following paper: Van Asseldonk, M.A.P.M., R.-J. Renes, T.J.G.M. Lam and H. Hogeveen, 2008. Awareness and perceived value of economic information in controlling somatic cell count. Submitted for publication

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Automated lameness detection by cow gait analysis: Does cow locomotion reveal claw health?

Hoof trimming is recommended twice a year, but more frequent examination of the hooves could alleviate many of the hoof health issues that characterize current dairy production with its increasing herd sizes and prolonged indoor housing periods. Additionally, or if hoof examinations are unavailable, gait scoring techniques are being used as a tool to assess cattle lameness. This lameness might be defined as an "*abnormal* gait of the cow" (e.g. reduced speed and ground contact force of the cow, changes in hoof placement, lowering of the head, etc.) "in an attempt to *minimize pain*". Observer gait scoring techniques need extensive training (subjectivity issues) and still require significant work, but they prove very useful in herd health surveys and in the assessment of animal welfare.

Alongside the reaction to coping with the pain mentioned above and associated with these common leg and claw problems, abnormal walking behaviour can be the result of many things: Depending on what is regarded as the "normal" reference situation, cow individual anatomy and attitude, udder size and health, oestrus, days in milk or even the floor condition might account for additional variance in walking behaviour.

Sound vs. lame cow behaviour

In a first series of weekly experiments, ILVO and UGent (Belgium) recorded the hoof health of 24 Holstein cows over a period of 3 months. Additionally, cow gait was recorded and the hoof positioning and timing were extracted from manually digitized images to investigate the relationship between cattle gait and claw lesions as indicated in literature (e.g. Flower and Weary, 2006). At herd level, and particularly because of cows with a sole ulcer or with interdigital hyperplasia present, signs of differences in gait pattern were noticed. Decreasing speed, tracking and stride distance, double support time and increasing stance and stride time (with the sound legs) seemed correlated with some of the claw diseases measured. However, owing to between variation between cows in "normal" gait, no reasonable claw health prediction could be expected at individual cow level.

Individual cow monitoring

As from 2007, a system based on a pressure sensitive surface (CIR Systems, Inc.) (see Figure 1) is able to measure all hoof imprints of about 3 consecutive gait cycles of each member of a 90 cow herd once a day. Hoof imprints are analysed offline using custom quadruped gait analysis software. This upgrade to a semi-automatic gait analysis method was needed to assure that a larger amount of cows could be followed individually and more frequently in time. Currently, about 70% of the cow walks can be used for data analysis. Measurements with cows accelerating, running, slipping or walking very irregularly (e.g. due to extreme lameness) cannot be used.

In contrast with the first herd level study and multivariate analysis covering claw health and gait variables the objective is to detect changes in gait and to find out whether they relate to the onset of clinical lameness. Now, instead of comparing "sound" and "lame" cows, each cow serves as its own reference. Since August 2008, weekly claw health records, gait scores and cow management data (days in milk, production, oestrus, etc.) are added to the gait analysis data in an effort to explain some of the shifts measured in walking behaviour. See Figure 2.

Expectations

Several systems have been made available for daily cow monitoring. BouMatic has commercialised the StepMetix system and the use of step counters or activity measurements might be interesting as well.

Figure 1. Cow walking on the pressure-sensitive surface

Research on cow weight distribution (e.g. in a milking robot) looks very promising (Pastell et al.,2006). Regarding automated cow gait analysis, time will tell whether it is sensitive (and selective) enough to make it another dairy farm management tool.

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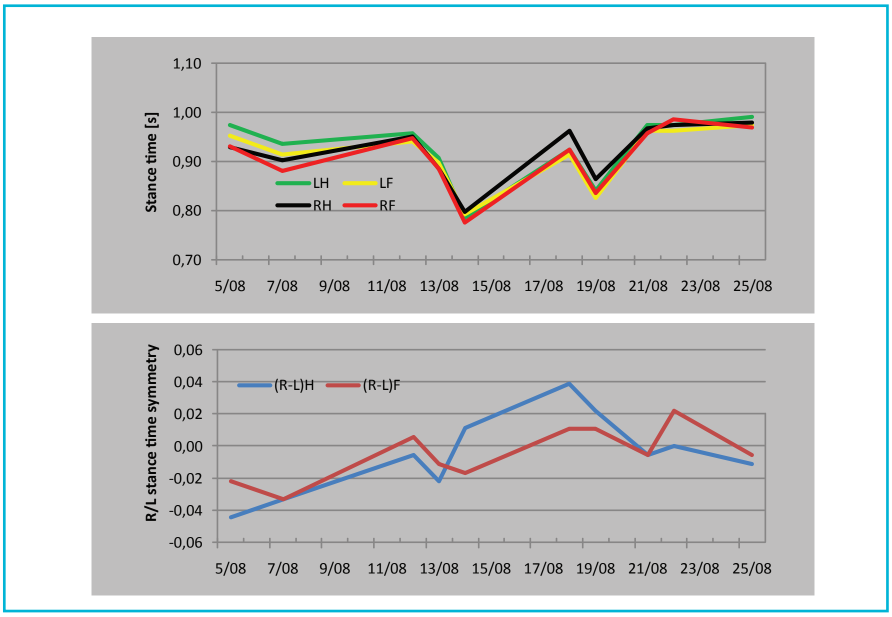

Figure 2. Gait analysis (R = right, L = left, H = hind, F = fore)

Economic impact of Blue tongue in the Netherlands

The economic consequences of the Blue tongue (BT) epidemic of 2006 and 2007 in the Netherlands was calculated and eight possible BT vaccination strategies for the expected epidemic of 2008 were ranked based on economic parameters. An economic model was constructed, reflecting Dutch livestock production systems for cattle, sheep and goats. The economic impact of BT has been calculated by an integration of demographic, epidemiological and economic data. The quantified economic impact of BT included i) production loss due to diseased farm animals, ii) diagnosis costs and costs for monitoring of BT in the Netherlands, iii) treatment costs for diseased animals, iv) economic impact as a result of measures to control the epidemic and v) economic impact as a consequence of export restrictions.

The total economic impact related to the BT epidemic in 2006 has been valued at 28.5 million Euros and to the BT epidemic in 2007 at 49.3 million Euros. Compulsory in-door housing was responsible for 63% of the total economic impact in 2006, transport restrictions 29% and diagnosis costs 8%. The production loss in 2006 was only 0.4% of the total economic impact because the number of BT infected farms and animals was relative low. In 2007, 62% of the total economic impact was production loss, 22% concerned the costs for treating diseased animals and 13% of the economic impact resulted from the transport restrictions.

The cattle sector suffered most economic impact, i.e. 86% of total economic impact in the 2006 epidemic and 89% of the impact in the 2007 epidemic. Within the cattle sector, the economic impact for the dairy farmers was highest. Thereafter, the exporters and the quarantine farms for export experienced most economic impact. Within the sheep sector, the sheep producers suffered most economic impact.

The evaluation of the vaccination strategies is based on a comparison with the baseline scenario: the expected epidemic in 2008 in which no vaccination is applied. The calculated economic impact for the baseline epidemic equals 19.6 million Euros. Subsequently, the economic impact of BT epidemics in 2008 has been valued given different vaccination strategies. The reduction of the economic impact due to the vaccination strategy defines the benefit of the strategy. Based on the costs of the vaccination strategy and benefits, three economic criteria to rank the vaccination strategies have been calculated: cost-benefit ratio, net profit and the total vaccination costs.

Vaccination of all adult cattle in the four Northern provinces of the Netherlands is the best vaccination strategy to control the BT epidemic of 2008. The cost-benefit ratio of this strategy is 0.31 what means that each €0.31 of costs result in €1.00 of benefits. The net profit is 6.2 million Euros, while vaccination costs should be 2.8 million Euros. The second best vaccination strategy is vaccination of all adult sheep in the Netherlands and all adult cattle in the four Northern provinces. The cost-benefit ratio of this strategy (0.82) is 2.6 times higher then the ratio of the first ranked strategy, its net profit (1.9 million Euros) is 3.2 times lower, and the vaccination costs (8.7 million Euros) are 3.1 times higher. The third ranked strategy is to vaccinate all adult cattle in the whole of the Netherlands. Here the cost-benefit ratio (0.83) is 2.7 times higher than the first ranked strategy, the net profit (2.2 million Euros) 2.8 times lower, while the vaccination costs (10.2 million Euros) are 3.6 times higher.
From the sensitivity analysis it can be concluded that the ranking of the vaccination strategies will not change when the expected number of BT infected farms increases or decreases.

This summary is based upon the following paper: A.G.J. Velthuis, H. Saatkamp, M.C.M. Mourits, A.A. de Koeijer and A.R.W. Elbers (2008). Economic impact of the Dutch Bluetongue epidemic of 2006 and 2007. Submitted for publication.

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Sustainability in dairy farming - food production and environment protection

The future development in dairying worldwide will be influenced by factors associated with sustainability in dairying and progress in environmental protection. The following short statement is an abstract of a paper presented during the International Conference on Linking Systems Thinking, Innovations, Quality, Entrepreneurship and Environment, in Maribor, Slovenia, 26 -28 June, 2008.

Globalization and environmental influences are the two main factors of influence that will modify and regulate nearly all areas of our future life. Especially against the background of general future development agricultural productivity has to be increased without further impairment of the environment. Using dairy farming as an example, this paper describes the worldwide prospects in animal production by 2015. The trends include social aspects as well as environmental and economic ones.

No doubt the available hectare size per capita will continue to be reduced, mainly driven by population increase, expanding infrastructure (e. g. new roads) and new buildings. It seems realistic to assume that we will have less than 0.19 ha/capita available in 2015 compared to 0.24 ha/capita in 2000. The implication consists in a noticeable increase in agricultural productivity.

In addition, we have to use the positive effects of globalization, like increased mobility of goods, economic growth and poverty reduction in countries such as China, India and others. Yet, the regulation of globalization has to be improved by political and economic decisions. Overall, globalization is a worldwide need and its goal should consist in a worldwide alliance of responsibility.

The main six worldwide problems with regard to dairying are:

1) population growth from currently 6.7 billion to 9.2 billion in 2050;
2) Water scarcity;
3) Poverty and hunger;
4) Economic growth;
5) Demand for food;
6) Food production versus alternative

energies. To solve at least some of these problems, we need innovations, new technologies and trade liberalization. Only substantial progress in these fields will offer a higher degree of sustainability in dairying and other agricultural production areas. However, to achieve the highest degree possible, a balance between the aspects of productivity, climate, ethics, ecology, welfare, consumer and politics will be required as well.

The paper details selected general trends in animal production including dairying by 2015 and offers the potential of innovations to improve the current status quo. The main aspects are:

1) Consumer behavior and global/regional food consumption;
2) Economics of dairying at farm level;
3) Interaction between dairying and greenhouse gases;
4) Sustainable dairying.

Overall, the challenge for future animal production consists in the increase of food production (food security) with minimal impairment of soil fertility, loss of water resources, the environment and food safety. The most convincing way to approach this objective is sustainability.

Colleagues who would like to get the full paper should ask via E-mail.

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In-line monitoring of somatic cell count does improve automatic detection of clinical mastitis

Sensors for electrical conductivity have been available for some time, and now sensors for in-line somatic cell count are becoming available (Figure 1).

The potential value of in-line composite SCC (**ISCC**) sensing as a sole criterion for automatic detection of clinical mastitis (**CM**) during automatic milking has been studied, or ISCC in combination with quarter-based electrical conductivity (**EC**) of milk,. Data, generated from a New Zealand research herd of about 200 cows milked by 2 automatic milking systems during the 2006/07 milking season, included EC, ISCC, monthly laboratory-determined SCC, and observed cases of CM that were treated with antibiotics.

Milk samples for ISCC and laboratory-determined SCC were taken sequentially at the end of milking. Both samples were derived from a composite cow milking obtained from the bottom of the milk receiver. Different time-windows were defined in which true positive, false negative and false positive alerts were determined. Quarters suspected of having CM were visually checked and, if CM was confirmed, sampled for bacteriological culturing and given an antibiotic treatment. These treated quarters were considered as 'gold standard' positives in comparing CM detection models. Parameter settings were adjusted to achieve a sensitivity of 80% in three detection models including ISCC alone, EC alone or a combination of these two. The positive predictive value (**PV+**) and the number of false positive attentions per 1000 cow milkings (**FP1000**) were used to evaluate detection performance.

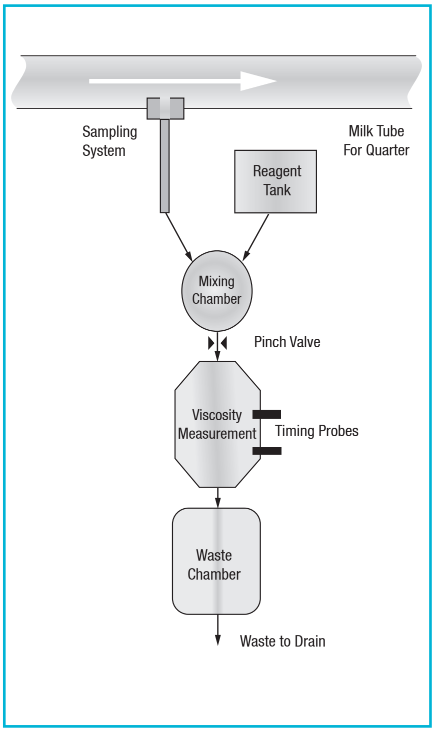

Figure 1. Schematic representation of the in-line SCC sensor

Standardized ISCC estimates were highly correlated with standard laboratory-determined SCC measurements (r =0.82) for SCC measurements above 200 x 103cells/ml. Using EC alone as a detection tool resulted in a PV+ range of 9.1-11.9%, and an FP1000 range of 4.6-6.2% (Table 1).

Table 1: Performance statistics, given a sensitivity of 80 %, using electrical conductivity (EC) and/or in-line SCC (ISCC) information as a detection tool for clinical mastitis

		Alerts based on EC		Alerts based on ISCC		Alerts based on EC and ISCC	
Time-window Alertperiod[1] (hours)	Time-window Obsperiod[2] (hours)	PV+[3] (%)	FP1000[4]	PV+ (%)	FP1000	FP1000	FP1000
96	48	11.9	4.6	12.9	3.9	33.3	1.2
96	24	11.9	4.6	12.9	3.9	33.3	1.2
72	24	11	5	10.7	4.9	30.2	1.4
48	24	9.1	6.2	8.8	6.1	25.8	1.9

[1] Alertperiod = automatically detected period of clinical mastitis: time of alert extended by a specified number of hours.
[2] Obsperiod = observational period of clinical mastitis: starts at 12:00 noon at the day of treatment of a clinical mastitis case extended by a specified number of hours.
[3] PV+ = positive predictive value.
[4] FP1000 = number of false positive attentions per 1000 cow milkings.

Values for the ISCC model were similar with 8.8-12.9% for the PV+ and 3.9-6.1% for the FP1000. Combining sensor information to detect CM, using a fuzzy logic algorithm, produced a 3-fold increase in the PV+ (range 25.4 -33.3%) and a 3-fold decrease in the FP1000 (range 1.2-1.9%). Results suggest that estimating ISCC from a composite cow milking contributes to an automatic sensing system for the detection of CM by reducing the number of false positive attentions while keeping the sensitivity of detection at a reasonable level.

This summary is based upon the following paper: Kamphuis, C., R. Sherlock, J. Jago, G. Mein and H. Hogeveen (2008). Automatic detection of clinical mastitis is improved by in-line monitoring of somatic cell count. Journal of Dairy Science, in press.

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Methicillin-Resistant Staphylococci and Dairy Food

A recent letter to the editor of the Journal of Dairy Science (Walther and Perreten 2007) reported that a dairy cow on an organic farm in Switzerland was diagnosed with subclinical mastitis caused by methicillin-resistant *Staphylococcus epidermidis*. *Staphylococcus epidermidis* was isolated on two occasions within a two-month period. Antibiotic use on the farm was restricted. The first *S. epidermidis* isolate was resistant to chloramphenicol and carried resistance genes for both streptomycin and trimethoprim, and the second isolate contained an additional gene for resistance to aminoglycosides. Both isolates had identical pulsed-field gel electrophoresis fingerprints suggesting that the same strain had acquired further resistance by horizontal gene transfer. The letter concluded, "The presence of methicillin-resistance *S. epidermidis* in organic food producing animals should convince farmers, veterinarians, public health authorities, cheese producers and cheese retailers to take adequate measures to limit the spread of antibiotic-resistant bacteria to humans via the food chain." The origin of the isolates was not discussed and is of importance, particularly in light of the authors' final remarks.

While the case documents the potential for multi-drug resistant organisms to occur in milk and thus identifies milk as a potential source for multi-drug resistant organisms, the letter does not address the source of the methicillin-resistant organism that caused the intramammary infection. Given the restricted use of antibiotics in cattle on the farm, it is likely that the resistant organism originated from a human. Data gathered to date demonstrate interspecies transmission of methicillin-resistant staphylococci. Some studies suggest that human epidemic strains are responsible for animal colonization (Khana et al. 2007), while other studies suggest that animals may serve as a reservoir for infection of humans (van Loo et al. 2007).

Gastroenteritis caused by consumption of coleslaw contaminated with methicillin-resistant *Staphylococcus aureus* (MRSA) has been reported, but the source of the food contamination was a colonized food handler who intermittently visited a nursing home (Jones et al. 2002). A recent Italian study showed that MRSA was present, albeit at a low rate (0.36%), in foods of animal origin (Normanno et al. 2007). In that study, MRSA was detected in four milk samples and two cheese samples. Three of the isolates belonged to a non-host specific biovar and three belonged to a sheep biovar suggesting that MRSA of animal origin may be present in dairy products. All isolates were capable of producing at least one enterotoxin, a leading cause of human food poisoning.

These reports demonstrate that interspecies transmission of methicillin-resistant staphylococci clearly occurs, while the source of the resistant staphylococci varies depending on the study. Foodborne illness following consumption of contaminated product is also a possibility.

The question is where should critical control points be implemented to prevent contamination of dairy products? Colonization of the hands appears to be a major contributor to transmission of *S. aureus* and MRSA in hospitals, and *S. aureus* has been shown to colonize milkers' hands. It would seem prudent, therefore, that milkers wear gloves during milking and wash their hands frequently to prevent interspecies transmission in the milking parlor. Post-harvest contamination of products is another possible mechanism for adulteration of food as illustrated by Jones and co-workers (2002). Hence, appropriate hygiene needs to be exercised by food processors and food handlers.

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NMC Research Committee Note
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Expression and Analysis of Activity of Antibacterial Peptide CecropinB in Dairy Goat Mammary Gland

Mastitis is one of most serious diseases to threaten dairy cows and dairy goats. In this research we wanted to investigate the expression of the activity of antibacterial peptide cecropinB in goat mammary epithelial cells as a transgenic method to treat mastitis. The full-length cecropinB cDNA fragment was amplified by PCR from the cecropinB cDNA library and was inserted into eukaryotic expression vector pEGFP-C1, after the identification by digestion and sequencing on the recombinant eukaryotic expression vector pEGFP-B. Thereafter, the liposome Tfx^{M}-20 was employed as the vector, and the goat mammary epithelial cells were transfected with liposome pEGFP-cecropinB and blank vector pEGFP-C1 respectively. The normal cells were taken as control. By screening the culture with G418, a stable transfected goat mammary epithelial cell line was established and the transcription and expression of cecropinB were identified by RT-PCR and agarose diffusion respectively. The cells were disrupted and the supernatant was collected and their bactericidal activities after 72 hours were determined. For healthy goats and mastitic goats, the recombinant plasmid DNA was injected into udders and the anti-bacterial activity of milk was determined.

The eukaryotic expression vector pEGFP-B was constructed successfully; RT-PCR demonstrated that the gene band was 340 bp or so and was consistent with the expected molecular weight of the cecropinB gene. The supernatant of the disrupted cell liquid transfected by pEGFP-cecropinB exhibited bactericidal activity to *Staphylococcus aureus* when compared with that from normal cells and cells transfected with blank vectors. The stable transfected goat mammary epithelial cell line was established and the cecropinB protein was expressed successfully. Again in healthy goats and mastitic goats, the recombinant plasmid DNA was injected into udders, the anti-bacterial activity of milk was detected.
The expression of cecropinB cDNA was proved to be expressed correctly in goat mammary epithelial cells. The cecropinB can resist goat mastitis.

Conclusion: The construction of the eukaryotic expression vector pEGFP-B was made successfully; cecropinB cDNA was proved to express correctly in goat mammary epithelial cells. The stable transfected goat mammary epithelial cell line was established, the milk of healthy goats and mastitic goats both expressed anti-bacterial activity, and this demonstrated that the recombinant plasmid expressed cecropinB successfully. This study provides solid foundation for further experimental studies on the function of cecropinB and therapeutic measures of mastitis.

Keywords: CecropinB; Eukaryotic expression vector; Goat mammary epithelial cell; Transfection; Gene expression; Bactericidal activity

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Expression of Human α-LA and LacZ Gene in Bovine Mammary Epithelial Cells

Abstract Milk and whey contain relatively large amounts of lactose. Lactose intolerance is common in many parts of the world. For example 70%-90% of adults in Asia and Africa are prone to it. Among these populations lactose intolerance largely limits the intake of milk and dairy products. The enzyme β-galactosidase can hydrolyze the lactose of milk and whey. The reduction of lactose content in this way can solve the problem of the people with lactose intolerance and improve the nutritional value of milk and dairy products. At the same time, the reduction of lactose can eliminate the inconvenience of lactose crystallization and separation when whey is condensed in dairy processing.

The composition of cows milk differs from that of human milk. The greater part of the proteins in human milk are whey proteins, about 70% of total proteins, and the rest is caseins. The greater part of the proteins in cows milk are caseins, about 78.8% of total proteins, and whey proteins are less, comprising the remaining 21.2% of total proteins. The nutritional value of cows milk can be improved if the composition and content of milk protein can be changed to be closer to those of human milk. Transgenic technology can be used to change the milk composition to improve the nutritional value and suitability for processing. The changes include improvement in the content of some high value components, elimination of unwanted components, producing of some components present in human milk and producing bioactive protein compounds by the mammary gland bioreactor. Alpha lactalbumin is the main protein of whey proteins. It is a good source of essential amino-acids and branched-chain amino acids. Alpha lactalbumin can regulate the production of milk. And it is the only protein among whey proteins that can bind metals, including calcium. It also has other properties, such as bacteriostasis, suppression of apoptosis and enhancement of cerebral reaction ability.

This study was designed to construct the eukaryotic expression vector by gene recombination technology and express the human α-lactalbumin gene and β-galactosidase gene in bovine mammary epithelial cells to produce active human α-lactalbumin and β-galactosidase.The β-galactosidase can reduce the lactose content in milk. The study aimed at the further expression of the human α-lactalbumin gene and the β-galactosidase gene at a high level in the mammary glands of cows. That would provide a viable technical means and a credible theoretical background for production of transgenic animal milk and for improvement of the quality of milk.

In this study, the 5' flanking regulatory regions of bovine αS1 casein gene (1.2kb) was amplified by PCR and human α- lactalbumin gene cDNA (0.76kb) was synthesized. The 1.2kb region of the 5' flanking sequence of bovine casein gene and human α-lactalbumin gene were combined with the PSV vector which has SV40 promotor and β-galactosidase gene (LacZ gene) to construct the expression vector αS1-LA-psv. At the same time, the human α-lactalbumin gene cDNA (0.76kb) was combined with the PSV vector behind the SV40 promotor (without LacZ

gene) to construct the expression vector LA-cDNA-psv. Bovine mammary epithelial cell tissue was cultured and purified and identified by the tissue-special expression of cytokeratin 18.

Afterwards, the eukaryotic expression vector αS1-LA-psv was transfered into bovine mammary epithelial cells by a cationic liposome vector. Then the expression of β-galactosidase was detected by two ways in bovine mammary epithelial cells. The first way is by situ staining in the cells in which the β-galactosidase could catalyze the disassociation of X-gal. The production of dark blue coloration in the cells was observed by optical microscope, which is the expression of β-galactosidase in the cells. The second way is by the Beta-Glo E2000 detection system produced by Promega. The activity of β-galactosidase from 24h to 120h in cell lysate and culture medium were determined. The results showed that in the cell lysate the expression of lacZ gene could be detected 24h after transfection and had a gradual upward trend which declined at 72h and reached the minimum at 144h. In the cell culture medium, the expression of lacZ gene can also be detected 24h after transfection, and had a gradually upward trend which declined at 48h, reaching the minimum also at 144h. The cells which were transfected were passaged, the expression of β-galactosidase was also detected at the first and second generation, but from the third generation the expression could not be detected any more. The lactose content in the transfected cells was determined by HLPC. The results showed there was no change at 24h, and a notable reduction appeared from 24h to 144h, the most reduction appearing from 48h to 72h. The expression of human α-lactalbumin was detected by Western Blot at 72 h after transfection. The production of human α- lactalbumin was 0.64mg/mL approximately.

The eukaryotic expression vector LA-cDNA-psv was also transfered into bovine mammary epithelial cells by a cationic liposome vector. The expression of human α- lactalbumin was detected by Western Blot at 72 hour after transfection. The production of human α- lactalbumin was 0.85 mg/mL approximately.

All these results showed bovine mammary epithelial cell tissue which was cultured and purified to have the ability to express the exogenous genes, the 5' flanking regulatory regions of bovine αS1 casein gene (1.2kb) which was cloned have the capacity to direct the expression of exogenous genes highly, and the constructed expression vector can express β-galactosidase and α- lactalbumin in bovine mammary epithelial cells.

In this study, the eukaryotic expression vector αS1-LA-psv was also injected into normal bovine mammary gland. After transfection, the lactose content and milk production were determined from 24h to 120h The notable reduction of lactose content appeared from 24h to 120h and there was no notable change in milk production. These results showed that the constructed expression vector can also express the exogenous genes in the bovine mammary gland and produce the diabetic milk without effect on the normal lactation.

Key words: regulatory sequence; human α-lactalbumin; β-galactosidase; vector construction; mammary epithelial cell; gene expression

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Automatic diagnosis of pathogens causing mastitis

Clinical mastitis (CM) needs an effective treatment to eliminate the infection that causes it. CM can be caused by a wide variety of pathogens. Knowing the causal pathogens and, subsequently, using appropriate treatments, will increase the cure rate of CM. Bacteriological culturing will provide information about the causal pathogens. However, because CM needs a treatment immediately after detection, information from culturing comes too late. In the absence of bacteriological culture results, several other sources of information are available on a dairy farm that could aid in the diagnosis of the causal pathogens of a CM case.

In previous studies, various classification models for pathogen identification for CM were constructed. A disadvantage of these models was that they just indicated the most likely causal pathogen. For choosing among treatment options, a probability distribution over the causal pathogens of a CM case would be more informative as it reveals the uncertainty involved in the classification. For instance, almost equal probabilities for two or more causal pathogens would support the decision for a broad spectrum antibiotic treatment while a very high probability for a particular pathogen would support the choice for a more specific treatment.

The objective of this study was to provide a posterior probability distribution on the Gram status (Gram-negative vs. Gram-positive pathogens) for CM cases based on information on clinical signs, several cow factors and season of the year. To examine the posterior probability distribution on the Gram status, the accuracy (percentage of correct classifications) was determined.

The posterior probability distribution on the Gram status of the pathogens was developed using Naive Bayesian Networks (NBN). A NBN will give a probability for the outcome variable being in a certain state. Data were used from 274 Dutch dairy herds that recorded CM over an 18 month period. The final dataset contained information on 3534 CM cases, all cases being classified into Gram-negative and Gram-positive pathogens. Several information sources about a cow that are usually available at a dairy farm were included as variables in the NBN. These information sources include cow factors (parity, month in lactation and quarter position), historical data (on somatic cell count and CM), clinical signs (being sick or not, and color and texture of the milk) and season of the year.

For each CM case, a posterior probability distribution on the Gram status was determined. Using the most likely Gram status (with the highest posterior probability) as the predicted value, the accuracy of classifying CM cases into Gram-positive or Gram-negative pathogens was 73%.

In practice on a farm, only CM cases with a very high posterior probability on a single pathogen will be eligible for pathogen-specific treatment. CM cases which resulted in more or less equal posterior probabilities, will be more eligible for broad spectrum use of antibiotics. By providing probability distributions on the causal pathogens, the farmer can readily distinguish between such cases. To establish the accuracy of the models for CM cases with a high posterior probability (for instance > 0.80) on Gram-negative or Gram-positive pathogens, all other cases were left unclassified. These accuracies will be called stratified accuracies, since they are based upon different strata of the dataset under study.

A total of 378 CM cases resulted in a posterior probability of over 0.90 of the CM being caused by a Gram-positive pathogen or by a Gram-negative pathogen. Of these 378 CM cases, 90% were classified correctly. This means that for 31% of the CM cases a stratified accuracy of 90% could be reached. For 14% of the CM cases a stratified accuracy of 96% could be reached (Table 1).

The NBN presented can be used as a guideline for decision support of choice and duration of treatment of CM cases. For CM cases with high posterior probabilities of CM caused by Gram-negative or Gram-positive pathogens a more specific treatment can be chosen which will result in higher cure rates. While for CM cases with almost equal posterior probabilities of the Gram status a broad spectrum antibiotic treatment needs to be considered. On a farm the availability of a probability distribution is an improvement in comparison with the current situation where information on the causal pathogens is not provided at all.

This is a summary of the article: Providing probability distributions on the causal pathogen of clinical mastitis using naive Bayesian networks. By W. Steeneveld, L. C. van der Gaag, H. W. Barkema, and H. Hogeveen. Submitted for publication .

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Table 1: Stratified accuracy at different thresholds on the posterior probability Gram-negative vs. Gram-positive pathogens.

Threshold on posterior probability	Number (%) of CM cases above threshold	Stratified accuracy (%)
0.70	900 (785%)	81
0.75	817 (68%)	83
0.80	660 (55%)	86
0.85	538 (45%)	89
0.90	378 (31%)	90
0.95	168 (14%)	96

Meetings

Ongoing work in National Mastitis Council

Currently, NMC is working on the following subjects:

NMC 48th Annual Meeting
January 25-28, 2009
Westin Hotel
Charlotte, North Carolina

The National Mastitis Research Foundation Board of Directors selected four graduate students – Rick Watters, Jennifer McCarron, Patrícia Yoshida Faccioli and Wilma Steeneveld – as winners in the NMC Scholars Program. The purpose of the program is to provide funding for recipients to attend the NMC 48th Annual Meeting, January 25-28, 2009.

Preparation of position paper on the safety of raw (unpasteurized) milk.

Developed a "note" on MRSA. Published in Udder Topics vol.31 #2. This work can also be found elsewhere in this issue of the IDF Animal Health Newsletter.

5th IDF International Mastitis Conference Christchurch, New Zealand 21-24 March 2010

If you are interested in understanding the most up-to-date methods for producing milk of the best quality to ensure its full functionality and benefits then you must join the milk quality managers, mastitis researchers and experts, veterinarians and leading farmers from around the world at this important IDF scientific conference.

The programme will examine practical ways to improve milk quality by implementing solutions as part of whole farm system management whether that system is intensive, extensive (e.g. pastoral-based), or in the nature of community-based systems as seen in developing countries. In this novel approach to mastitis management, the differing impacts of the farm system will be considered as part of an integrated approach to mastitis management which considers aspects of the host (e.g. the impact of animal genetics on susceptibility to mastitis), the environment (e.g. the role of cow nutrition) and the pathogen (e.g. bacterial expression of virulence).

Outstanding plenary speakers, the global experts in their fields, will introduce the key conference themes which will be followed by presentations of original contributions (both presented papers and posters) which delegates are invited to submit.

The conference programme will include many opportunities for discussion and social engagement, as well as technical tours to New Zealand farms and industry facilities. An 'accompanying person' programme will provide opportunities for local tours and entertainment while delegates partìcpate in the conference. This is an opportunity to visit New Zealand, one of the world's most celebrated travel destinations during early autumn, a beautiful time of the year.

You can pre-register for the conference at www.vetlearn.org.nz and you will be sent announcements and other details when submissions are called for in early 2009.

2nd ParaTB Forum Minnesota, USA – August 7-8, 2009

The 2nd ParaTB Forum will be held on August 7 and 8, 2009 in St. Paul - Minneapolis, Minnesota, USA. This meeting precedes the 10th International Colloquium on Paratuberculosis (10ICP), which is August 9-13 in Minnesota, USA. The aim of the ParaTB Forum is to provide a platform for discussions specifically on challenges and experiences with paratuberculosis control, surveillance and certification programmes.

This 2nd meeting is a follow-up to the successful 1st ParaTB Forum held in Shanghai, China in October 2006. At that meeting, presentations about paratuberculosis programmes in different countries (e.g. Australia, Denmark, Finland, Japan, New Zealand and USA) were discussed. The proceedings from the meeting were published in the Bulletin of IDF No. 410. The theme for the 2nd ParaTB Forum will be "Monitoring success of paratuberculosis programmes".
For more information about the 2nd ParaTB Forum, please contact:
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International Conference Mastitis Control 2008: From Science to Practice, The Hague, 30 Sep – 2 Oct 2008

Mastitis has been one of the most intensively studied diseases in the dairy industry in recent decades. The reasons for this interest are obvious. Mastitis affects the health of dairy cows. A large proportion of cows suffer from mastitis and it is one of the most important reasons for culling. Mastitis is thus responsible for a decrease in farm profitability, a decline in animal welfare and a reduction in the farmer's job satisfaction. Moreover, mastitis negatively influences milk quality and this affects dairy processing.

Since 2005, a large number of mastitis research projects have been started in The Netherlands. The scope of each of these projects is different but they have one thing in common, they are all directed towards the improvement of on-farm udder health – from science to practice. And that is why the Dutch dairy industry took the initiative to organize an International Conference on Mastitis Control, with this "science to practice" theme. The conference was organized by the Netherlands National Committee of the IDF, The Dutch Dairy Association (NZO), The Faculty of Veterinary Medicine of Utrecht University, The Dutch Udder Health Centre (UGCN), GD Animal Health Service and Wageningen University.

During the three-day International Conference on Mastitis Control 2008: From Science to Practice, more than 340 participants from 26 countries shared their thoughts and experiences on the application of their mastitis research in practice. The program consisted of 43 lectures and 61 poster presentations on five themes; Management, planning and control; Infectious pressure; Milking and milking machine; Resistance; and Detection, diagnosis and treatment. The excellent presentations together provided a state of the art on mastitis research and contributed to a better understanding of mastitis control and the use of knowledge in practice. All contributions are assembled into a 470-page hard-cover conference proceedings book, published by Wageningen Academic Publishers.

The organizing committee would like to express their gratitude to the sponsors and the Dutch dairy industry for their contributions to this successful conference. In addition, the organizing committee would like to emphasize the need for knowledge exchange on mastitis research in the future and challenges others to surpass.

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